

DAFTAR PUSTAKA

- Aagaard C, Govaerts M, Meikle V, Gutiérrez-Pabello JA, McNair J, Andersen P, Suárez-Güemes F, Pollock J, Espitia C, Cataldi A. 2010. Detection of bovine tuberculosis in herds with different disease prevalence and influence of paratuberculosis infection on PPDB and ESAT-6/CFP10 specificity. *Prev Vet Med.* 2010 Sep 1; 96(3-4):161-9.
- Abbas, Abul K., Lichtman, Andrew H. 2011. *Basic Immunology, Functions, and Disorder of The Immune System-Philadelphia* : Saunders-Elsevier Inc.
- Abbas, Abul K., Lichtman, Andrew H., Pillai, Shiv. 2007. *Cellular and Molecular Immunology.* Saunders-Elsevier Inc.
- Abdallah AM, Gey van Pittius NC, Champion PA, Cox J, Luirink J, Vandenbroucke-Grauls CM, Appelmelk BJ, Bitter W. 2007. Type VII secretion--mycobacteria show the way. *Nat Rev Microbiol.* 2007 Nov; 5(11):883-91.
- Abou-Zeid, C., M. P. Gares, J. Inwald, R. Janssen, Y. Zhang, D. B. Young, C. Hetzel, J. R. Lamb, S. L. Baldwin, I. M. Orme, et al. 1997. Induction of a type 1 immune response to a recombinant antigen from *Mycobacterium tuberculosis* expressed in *Mycobacterium vaccae*. *Infect. Immun.* 65:1856.
- Agrewala JN, Mishra GC. 1995. A 38-kDa antigen of *Mycobacterium tuberculosis* predominantly induces the secretion of interleukin-2, interferon-gamma and IgG2a antibodies. *Microbiol Immunol* 1995;39:801-8.
- Amersham Bioscience. 2001. *Protein Purification Handbook.* 18-1132-29 Edition AC. Uppsala, Swedia.
- Andersen AB dan Hansen EB. 1989. Structure and mapping of antigenic domains of protein antigen b, a 38,000-molecular-weight protein of *Mycobacterium tuberculosis*. *Infect Immun.* 1989 Aug; 57(8):2481-8.
- Andersen, P. 1994. Effective Vaccination of Mice Against *Mycobacterium tuberculosis* Infection with a Soluble Mixture of Secreted Mycobacterial Proteins. *Infect. Immun.* 62 : 2536-2544.
- Application Note: Purification and renaturation of recombinant proteins produced in *Escherichia coli* as inclusion bodies. GE Healthcare 18-1112-33.
- Arend, S. M., P. Andersen, K.E. van Meijgaarden, R.L. Skjot, Y.W. Subronto, J.T. van Dissel, T.H. OttenhoV. 2000. Detection of active tuberculosis infection by T cell responses to early-secreted antigenic target 6-kDa protein and culture filtrate protein 10, *J. Infect. Dis.* 181 (2000) 1850-1854.
- Armstrong, J.A. dan Hart, P.D. 1971. Response of cultured macrophages to *Mycobacterium tuberculosis*, with observations on fusion of lysosomes with phagosomes. *J Exp Med.* 1971 Sep 1; 134(3 Pt 1):713-40
- Astarie-Dequeker, C., Le Guyader, L., Malaga, W., Seaphanh, F. K., Chalut, C., Lopez, A., Guilhot, C. 2009. Phthiocerol dimycocerosates of *M. tuberculosis* participate in macrophage invasion by inducing changes in the organization of plasma membrane lipids. *PLoS Pathog.* 2009 Feb; 5(2):e1000289.

- Axelrod, S., Oschkinat, H., Enders, J., Schlegel, B., Brinkmann, V., Kaufmann, S. H., Haas, A., Schaible, U.E. 2008. Delay of phagosome maturation by a mycobacterial lipid is reversed by nitric oxide. *Cell Microbiol.* 2008 Jul; 10(7):1530-45
- Berthet, F., J. Rauzier, E. M. Liem, W. Philipp, B. Gicquel, dan D. Portnoi. 1995. Characterization of the *Mycobacterium tuberculosis erp* gene encoding a potential cell surface protein with respective structure. *Microbiology* 141:2123-2130.
- Berthet, F. X., M. Lagranderie, P. Guonon, C. Lauren-Winter, D. Ensergeveix, P. Chavarot, F. Thouron, E. Maranghi, V. Pelicic, D. Portnoi, G. Marchal, dan B. Gicquel. 1998. Attenuation of virulence by disruption of the *Mycobacterium tuberculosis erp* gene. *Science* 282:759-762.
- Berthet, F. X., P. B. Rasmussen, I. Rosenkrands, P. Andersen, dan B. Gicquel. 1998. A *Mycobacterium tuberculosis* Operon Encoding ESAT-6 and A Novel Low-Molecular-Mass Culture Filtrate Protein (CFP-10). *Microbiology* 144 : 3195-3203.
- Black GF, Weir RE, Chaguluka SD, et al. 2003. Gamma interferon responses induced by a panel of recombinant and purified mycobacterial antigens in healthy, non-mycobacterium bovis BCG-vaccinated Malawian young adults. *Clin Diagn Lab Immunol* 2003;10:602–11.
- Brogden, K. A., Roth, J. A., Stanton, T. B., Bolin, C. A., Minion, F. C., dan Wannemuehler, M. J. 2000. *Mechanisms of Bacterial Pathogens*, 3rd edn. Washington D. C. : ASM Press.
- Buchacher A, Iberer G, Jungbauer A, Schwinn H, Josic D., 2001. Continuous removal of protein aggregates by annular chromatography. *Biotechnol Prog.* 2001 Jan-Feb;17(1):140-9.
- Campbell, Neil A. dan Reece, Jane B. *Biology*, Seventh Edition.
- Castañon-Arreola, Mauricio, López-Vidal, Yolanda, Espitia-Pinzón, Clara, dan Rogelio Hernández-Pando. 2005. A New Vaccine Against Tuberculosis Shows Greater Protection in A Mouse Model with Progressive Pulmonary Tuberculosis. *Tuberculosis* (2005) 85, 115-126.
- Chang, Z, Choundary A, Lathriga R. Quioco FA. 1994. The Immunodominant 38-kDa Lipoprotein antigen of *Mycobacterium tuberculosis* is a Phosphate-Binding Protein. *J. Biol Chem.*
- Chaudhary, V. K., Abhishek Kulshrestha, Ghata Gupta, Nitin Verma, Sampati kumari, S.K. Sharma, Amita Gupta, A.K. Tyagi. 2005. Expression and purification of 38-kDa and Mtb81 antigens of *Mycobacterium tuberculosis* for application in serodiagnosis, *Protein Expr. Purif.* 40 (2005) 169–176
- Chen J, Liu Y, Li X, Wang Y, Ding H, Ma G, Su Z. 2009. Cooperative effects of urea and L-arginine on protein refolding. *Protein Expr Purif.* 2009 Jul;66(1):82-90. doi: 10.1016/j.pep.2009.02.004. Epub 2009 Feb 20.
- Cheng VCC, Yew WW, Yuen KY. 2005. *Molecular Diagnostics in Tuberculosis.* *Eur J Clin Microbiol Infect Dis*, 24 :711-20.

- Colangeli, R., Heijbel, A., Williams, A.M., Manca, C., Chan, J., Lyashchenko, K., Gennaro, M.L. 1998. Three-step purification of lipopolysaccharide-free polyhistidinetagged recombinant antigens of *Mycobacterium tuberculosis*. *J of Chromatography B*, 714, pp. 223–235
- Collins, M. D., R. P. Kawakami, G. W. de Lisle, L. Pascopella, B. R. Bloom, W. R. Jacobs, Jr. 1995. Mutation of the principal sigma factor causes loss of virulence in a strain of the *M. tuberculosis* complex. *PNAS* vol. 92 no. 17:8036-8040.
- Converse SE, Mougous JD, Leavell MD, Leary JA, Bertozzi CR, Cox JS. MmpL8 is required for sulfolipid-1 biosynthesis and *Mycobacterium tuberculosis* virulence. *Proc Natl Acad Sci U S A*. 2003;100:6121–6. doi: 10.1073/pnas.1030024100.
- Cowley DJ, Mackin RB. Expression purification and characterization of recombinant of recombinant human proinsulin. *J FEBS Lett* 1997;402:124–30.
- Cross, Alan S. 2008. What is a virulent factor? *Crit Care* 12(6) : 196.
- Daffé, M. dan Etienne, G. 1999. Review The capsule of *Mycobacterium tuberculosis* and its implications for pathogenicity. *Tuber Lung Dis*. 1999; 79(3):153-69.
- de Mendonça-Lima L, Bordat Y, Pivert E, Recchi C, Neyrolles O, Maitournam A, Gicquel B, Reytrat JM. The allele encoding the mycobacterial Erp protein affects lung disease in mice. *Cell Microbiol*. 2003 Jan; 5(1):65-73.
- Dennison, C. dan Lovrien, R. 1997. Three phase partitioning concentration and purification of proteins. *Protein Expr. Purif*. 149-161.
- Departemen Kesehatan RI. 2002. Pedoman Nasional Penanggulangan Tuberkulosis, Cetakan ke-8. Jakarta : Departemen Kesehatan Republik Indonesia.
- Dorland. 1998. Kamus Kedokteran Dorland Edisi 25. Jakarta : EGC.
- Dormans J, Burger M, Aguilar D, et al. 2004. Correlation of virulence, lung pathology, bacterial load and delayed type hypersensitivity responses after infection with different genotypes in a BALB/c mouse model. *Clin Exp Immunol* 2004;137:460–8.
- Espitia C, Cervera I, González R, Mancilla R. 1989. A 38-kD *Mycobacterium tuberculosis* antigen associated with infection. Its isolation and serologic evaluation. *Clin Exp Immunol*. 1989 Sep; 77(3):373-7.
- Espitia C, Mancilla R. 1989. Identification, isolation and partial characterization of *Mycobacterium tuberculosis* glycoprotein antigens. *Clin Exp Immunol*. 1989 Sep; 77(3):378-83.
- Fan, Xiangdong, DianSheng Xu, Bing Lu, Jie `Xia, Dongzhi Wei. 2007. Improving the refolding of NTA protein by urea gradient and arginine gradient size-exclusion chromatography. *J. Biochem. Biophys. Methods* 70 (2008) 1130–1138.

- Fernandez P, Saint-Joanis B, Barilone N, Jackson M, Gicquel B, Cole ST, Alzari PM. 2006. The Ser/Thr protein kinase PknB is essential for sustaining myco-bacterial growth. *J Bacteriol.* 2006 Nov; 188(22):7778-84.
- Fischer, B., I. Sumner, and P. Goodenough. 1993. Isolation and renaturation of bio-active proteins expressed in *Escherichia coli* as inclusion bodies. *Biotechnol. Bioeng.*41: 3-13
- Forrellad, Marina A., Klepp, Laura I., Gioffre, Andre, et. al. 2013. Virulence factors of *Mycobacterium tuberculosis* complex. *PMC Virulence*, 4 (1): 3-66.
- GE Healthcare. 2007. Rapid and efficient purification and refolding of a (histidine)₆-tagged recombinant protein produced in *E. coli* as inclusion bodies, Application note 18-1134-37 AC. Uppsala, Swedia.
- González-Zamorano M, Mendoza-Hernández G, Xolalpa W, Parada C, Vallecillo AJ, Bigi F, Espitia C. 2009. Mycobacterium tuberculosis glycoproteomics based on ConA-lectin affinity capture of mannosylated proteins. *J Proteome Res.* 2009 Feb; 8(2):721-33.
- Harboe, M. dan Wiker, H. G. 1992. The 38-kDa protein of *Mycobacterium tuberculosis*: a review. *J Infect Dis* 1992;166: 874–84
- Harris, T.J.R. Expression of eucaryotic genes in *E.coli*. In: Williamson, R.(Ed.). 1983. *Genetic Engineering*. Vol. 4, Academic Press, London, pp. 127–185.
- Hartley, D. L. dan Kane, J. F. 1988. Properties of inclusion bodies from recombinant *Escherichia coli*. *Biochem. Sx. Trans* 16 : 101-102.
- Hengen, P. 1995. Purification of His-Tag fusion proteins from *Escherichia coli*. *Trends in Biochemical Sciences* 20 (7) : 285-6.
- Hertz CJ, Kiertcher SM, Godowski PJ, Bouis DA, Norgard MV, Roth MD, Modlin RL. 2001. Microbial lipopeptides stimulate dendritic cell maturation via Toll-like receptor 2. *J Immunol.* 2001 Feb 15; 166(4):2444-50
- Hoess, A., Arthur, A.K., Wanner, G., Fanning, E. 1988. Recovery of soluble, biologically active recombinant proteins from total bacterial lysates using ion exchange resin. *Bio/Technology* 6, pp. 1214–1217.
- Hoffmann C, Leis A, Niederweis M, Plitzko JM, Engelhardt H. 2008. Disclosure of the mycobacterial outer membrane: cryo-electron tomography and vitreous sections reveal the lipid bilayer structure. *Proc Natl Acad Sci U S A.* 2008 Mar 11; 105(10):3963-7.
- Hutchens, T. W. dan Yip, T.T. 1990. *Anal. Biochem.* 191 : 160-168.
- Iberer G, Schwinn H, Josić D, Jungbauer A, Buchacher A. 2001. Improved performance of protein separation by continuous annular chromatography in the size-exclusion mode. *J Chromatogr A.* 2001 Jun 29;921(1):15-24.
- Jawetz, Melnick, and Adelberg's *Medical Microbiology*, Twenty-Third Edition, International Edition. 2004. U.S. : Mc.Graw-Hill Education.
- Janknecht, R. dan Nordheim, A. 1992. *Gene* 121 halaman 321-324.

- Kane, J. F. and D. L. Hartley. 1991. Properties of recombinant protein-containing inclusion bodies in *Escherichia coli*. *Bioprocess Technol.*12: 121-145.
- Kelley, R.F., Winkler, M.E. 1990. Folding of eucaryotic proteins produced in *Escherichia coli*. *Genetic Engineering* 12, pp. 1–19.
- Kementrian Kesehatan Republik Indonesia, Direktorat Jendral Pengendalian Penyakit dan Penyehatan Lingkungan. 2011. Strategi Nasional Pengendalian TB di Indonesia 2010-2014. Jakarta.
- Knuth, M.W., Burgess, R.R. 1987. Purification of proteins in the denaturated state, in: *Protein purification: Micro to Macro*, A. R. Liss, Inc., pp. 279–305.
- Lillie, H., E. Schwarz, and R. Rudolph. 1998. Advances in refolding of proteins produced in *E. coli*. *Curr. Opin. Biotechnol.*9: 497-501.
- Lodish, A., Berk, A., dan Zipursky, S.L., et. al. 2000. Section 7.1 DNA Cloning with Plasmid Vector. New York : W. H. Freeman.
- Lopez B, Aguilar D, Orozco H, et al. 2003. A marked difference in pathogenesis and immune response induced by different genotypes. *Clin Exp Immunol* 2003;133:30–7
- López M, Sly LM, Luu Y, Young D, Cooper H, Reiner NE. 2003. The 19-kDa *Mycobacterium tuberculosis* protein induces macrophage apoptosis through Toll-like receptor-2. *J Immunol.* 2003 Mar 1; 170(5):2409-16.
- López-Vidal Y, Ponce de León-Rosales S, Castañón-Areola M, Rangel-Frausto MS, Meléndez-Herrada E, Sada-Díaz E . Response of IFN- γ and IgG to ESAT-6 and 38 kDa Recombinant Proteins and their Peptides from *Mycobacterium tuberculosis* in Tuberculosis Patients and symptomatic Household contacts May Indicate Possible Early-Stage Infection in the Latter. *Arch Med Res*2004;35:308–17.
- Loscalzo, Joseph. 2010. *Harrison's : Pulmonary and Critical Care Medicine*. New York : Mc. Graw-Hill.
- Lowe, P.E., et al. Solubilization, refolding and purification of eucaryotic proteins expressed in *E.coli*, in: *Protein purification: Micro to Macro*, A.R. 1987. Liss, Inc., pp. 429-442
- Macherey-Nagel, Inc., 2006. *Purification of Polyhistidine-Tagged Proteins*. Düren : Macherey-Nagel GmbH & Co. KG.
- Målen H, Pathak S, Søfteland T, de Souza GA, Wiker HG. 2010. Definition of novel cell envelope associated proteins in Triton X-114 extracts of *Mycobacterium tuberculosis* H37Rv. *BMC Microbiol.* 2010 Apr 29; 10():132.
- Marston, F. A. 1986. The purification of eukaryotic polypeptide synthesized in *Escherichia coli*. *Biochem. J* : 240 : 1-120.
- Marston, F.A.O., Lowe, P.A., Doel, M., Schoemaker, J.M., White, S., Angal, S. 1984. Purification of calf prochymosin (prorennin) synthesized in *Escherichia coli*. *Bio/Technology* 2,800–804.

- Mawuenyega KG, Forst CV, Dobos KM, Belisle JT, Chen J, Bradbury EM, Bradbury AR, Chen X . 2005. Mycobacterium tuberculosis functional network analysis by global subcellular protein profiling. *Mol Biol Cell*. 2005 Jan; 16(1):396-404.
- Middelberg, Anton P. J. 2002. Preparative protein refolding. *TRENDS in Biotechnology* Vol. 20 No. 10 October 2002.
- Mitraki, A., King, J. 1990. Protein folding intermediates and inclusion body formation. *Bio/Technology*7, pp. 690–697
- Mougous, J. D., Petzold, C. J., Senaratne, R. H., Lee, D. H., Akey, D. L., Lin, F. L., Munchel, S. E., Pratt, M. R., Riley, L. W., Leary, J. A., Berger, J. M., Bertozzi, C. R. 2004. Identification, function and structure of the mycobacterial sulfo-transferase that initiates sulfolipid-1 biosynthesis. *Nat Struct Mol Biol*. 2004 Aug; 11(8):721-9.
- Mukhopadhyay, A. 1997. Inclusion bodies and purification of proteins in biologically active forms *Adv. Biochem. Eng. Biotechnol*. 56, 61-109.
- Neufert C, Pai RK, Noss EH, Berger M, Boom WH, Harding CV. 2001. Mycobacterium tuberculosis 19-kDa lipoprotein promotes neutrophil activation. *J Immunol*. 2001 Aug 1; 167(3):1542-9.
- Noss, E. H., R. K. Pai, T. J. Sellati, J. D. Radolf, J. Belisle, D. T. Golenbock, W. H. Boom, dan C. V. Harding. 2001. Toll-like receptor 2-dependent inhibition of macrophage class II MHC expression and antigen processing by 19-kDa lipoprotein of *Mycobacterium tuberculosis*. *J. Immunol*. 167:910-918.
- Ophardt, Charles E. 2003. Denaturations of Protein, Virtual Chembook. Elmhurst College.
- Pallen MJ. 2002. The ESAT-6/WXG100 superfamily -- and a new Gram-positive secretion system? *Trends Microbiol*. 2002 May; 10(5):209-12.
- Park YK, Bai GH, Kim SJ. 2000. Restriction fragment length polymorphism analysis of *Mycobacterium tuberculosis* isolated from countries in the western Pacific region. *J Clin Microbiol* 2000;38:191-7
- Pathak SK, Basu S, Basu KK, Banerjee A, Pathak S, Bhattacharyya A, Kaisho T, Kundu M, Basu J. 2007. Direct extracellular interaction between the early secreted antigen ESAT-6 of Mycobacterium tuberculosis and TLR2 inhibits TLR signaling in macrophages. *Nat Immunol*. 2007 Jun; 8(6):610-8.
- Plorde, James J. 2004. Sherris Medical Microbiology, An Introduction to Infectious Disease 4th edition. USA : McGraw-Hill.
- Prescott, Lansing M. 2002. Prescott's Microbiology 5th Edition. McGraw-Hill Companies.
- Raras, Tri Yudani M. dan Lyrawati, Diana. 2011. Cloning and Expression of *pab* Gene of *M. tuberculosis* Isolated from Pulmonary TB Patient in *E. coli* DH5- α . *Med J Indones*; 20:247-55.
- Raviglione, Mario C. dan O'Brien, Richard J. (2010). Harrison's Pulmonary and Critical Care Medicine, Chapter 12 :Tuberculosis. U.S. : McGraw-Hill.

- Ravn P, Demissie A, Eguale T, Wondwosson H, Lein D, Amoudy HA, Mustafa AS, Jensen AK, Holm A, Rosenkrands I, Oftung F, Olobo J, von Reyn F, Andersen P. 1999. Human T cell responses to the ESAT-6 antigen from *Mycobacterium tuberculosis*. *J Infect Dis.* 1999 Mar; 179(3):637-45.
- Raynaud C, Papavinasasundaram KG, Speight RA, Springer B, Sander P, Böttger EC, Colston MJ, Draper P. 2002. The functions of OmpATb, a pore-forming protein of *Mycobacterium tuberculosis*. *Mol Microbiol.* 2002 Oct; 46(1):191-201.
- Renshaw, P. S., P. Panagiotidou, A. Whelan, S. V. Gordon, R. G. Hewinson, R. A. Williamson, dan M. D. Carr. 2002. Conclusive Evidence that The Major T-cell Antigens of The *Mycobacterium tuberculosis* Complex ESAT-6 and CFP-10 Form A Tight, 1:1 Complex and Characterization of The Structural Properties of ESAT-6, CFP-10, and The ESAT-6 *CFP-10 Complex, Implications for Pathogenesis and Virulence. *J. Biol. Chem.* 277 : 21598-21603.
- Rudolph, R. 1990. In: H. Tschesche (ed.). *Modern Methods in Protein and Nucleic Acid Research.* pp.149-172, Walter de Gruyter, NY, USA.
- Rudolph, R. and H. Lilie. 1996. In vitro folding of inclusion body proteins. *FASEB J.* 10: 49-56.
- Russell, D. G. 2001. Review *Mycobacterium tuberculosis*: here today, and here tomorrow. *Nat Rev Mol Cell Biol.* 2001 Aug; 2(8):569-77.
- Sassetti CM, Boyd DH, Rubin EJ. 2003. Genes required for mycobacterial growth defined by high density mutagenesis. *Mol Microbiol.* 2003 Apr; 48(1):77-84.
- Schein, C. 1990. Solubility as a function of protein structure and solvent components. *Bio/Technol.* 8: 308-317.
- Scopes, R. K. 1994. *Protein Purification, Principles and Practice*; 3rd ed; Springer Advanced Text in Chemistry, Springer-Verlag, N. Y.
- Senaratne RH, Mobasheri H, Papavinasasundaram KG, Jenner P, Lea EJ, Draper P. 1998. Expression of a gene for a porin-like protein of the OmpA family from *Mycobacterium tuberculosis* H37Rv. *J Bacteriol.* 1998 Jul; 180(14):3541-7.
- Shin, Hang-Cheol. 2001. Protein Folding, Misfolding, and Refolding of Therapeutic Proteins. *Biotechnol. Bioprocess Eng.* 6 : 237-243.
- Shinnick, T. M., and R. C. Good. 1994. *Mycobacterial* taxonomy. *Eur. J. Clin. Microbiol. Infect. Dis.* 13:884-901 .
- Shipman, J., Wilson, J., dan Todd, A. 1993. *An Introduction to Physical Science*, 7th Edition. D. C. : Heath.
- Simpson, Richard J. 2008. Adapted from "Concentrating Solutions of Protein" in appendix 5 of Purifying Proteins for Proteonomics (ed. Simpson). Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, USA, 2004.

- Singh, Mahavir dan Timmis, Kenneth. 1992. Hybrid Plasmid for 38 kDa Antigen of *M. tuberculosis*. U.S. Patent application Ser. No. 071882,574 filed May 13,1992.
- Skjot, R. L. V., T. Oettinger, I. Roswnkrands, P. Ravn, I. Brock, S. Jacobsen, dan P. Andersen. 2000. Comparative evaluation of Low-Molecular-Mass Protein from *Mycobacterium tuberculosis* Identifies Members of The ESAT-6 Family as Immunodominant T-cell Antigens. *Infect. Immun.* 68 : 214-220.
- Smith, Issar. 2003. *Mycobacterium tuberculosis* Pathogenesis and Molecular Determinants of Virulence. *Clinical Microbiology Reviews*, July 2003. p. 463-496
- Strathman, H. 1985. Membranes and membrane processes in biotechnology. *Trends Biotechnol*, 3, 112-18.
- Suenaga M, Ohmae H, Tsuji S, Itoh T, Nishimura O. Renaturation of recombinant human neurotrophin-3 from inclusion bodies using a suppressor agent of aggregation. *J Biotechnol Appl Biochem* 1998;28:119–24.
- Terpe, K. 2003. Overview of tag protein fusion : from molecular and biochemical fundamentals to commercial systems. *Appl Microbio Biotechnol* 60 : 523-533.
- Thermo Fisher Inc. 2013. Instruction His-Pur™ Ni-NTA Spin Columns. Rockford : Thermo Scientific.
- Thomson, C. M. dan Ward, W. W. 2002. Three phase portioning (TPP) : a rapid and preparative purification tool for GFP. In *Bioluminescence and Chemiluminescence*; Stanley, P. E., Krieka, L. J. Eds; World Scientific: N. J., pp 115-18.
- Tobian AA, Potter NS, Ramachandra L, Pai RK, Convery M, Boom WH, Harding CV. 2003. Alternate class I MHC antigen processing is inhibited by Toll-like receptor signaling pathogen-associated molecular patterns: *Mycobacterium tuberculosis* 19-kDa lipoprotein, CpG DNA, and lipopolysaccharide. *J Immunol.* 2003 Aug 1; 171(3):1413-22.
- Tsumoto, Kouhei, Ejima, Daisuke, Kumagai Izumi, dan Tsutomu Arakawa. 2003. Partial consideration inrefolding proteins from inclusion bodies. *Protein Expression and Purification* 28 (2003) 1-8
- van Crevet, Reinout, Nelwan, Ron H. H., de Lenne, Wilma, Yeliisan Veeraragu, Adri G. van der Zanden, Zulkifli Amin, Jos W. M. van der Meer, dan Dick van Soolingen. 2011. *Mycobacterium tuberculosis* Beijing Genotype Strains Associated with Febrile Response to Treatment. *Emerging Infectious Disease* : Vol. 7, No. 5, September-Oktober 2001.
- van der Wel N, Hava D, Houben D, Fluitsma D, van Zon M, Pierson J, Brenner M, Peters PJ. 2007. *M. tuberculosis* and *M. leprae* translocate from the phagolysosome to the cytosol in myeloid cells. *Cell.* 2007 Jun 29; 129(7):1287-98.
- Van der Zanden AGM. 2002. Spoligotyping, a Tool in Epidemiology, Diagnosis, and Control of Tuberculosis. Wageningen : Ponsen & Looijen BV.

- van Pittius, Gey, N. C., J. Gamielien, W. Hide, G. D. Brown, R. J. Siezen, and A. D. Beyers. 2001. The ESAT-6 gene cluster of *Mycobacterium tuberculosis* and other high G +C Gram-positive bacteria. *Genome Biol.* 2: 44.1-44.18.
- van Pittius, Nico C. Gey, Warren, Robin M., dan van Helden, Paul D. 2002. ESAT-6 and CFP-10 : What is The Diagnosis? *Infect Immun.*, 2002 November; 70 (11): 6509-6511.
- (a) van Soolingen D, Hermans PW, de Haas PE, Soll DR, Van Embden JD. 1991. Occurrence and stability of insertion sequences in *Mycobacterium tuberculosis* complex strains: evaluation of an insertion sequence-dependent DNA polymorphism as a tool in the epidemiology of tuberculosis. *J Clin Microbiol* 1991;29:2578-86.
- (b) van Soolingen D, Qian L, de Haas PE, Douglas JT, Traore H, Portaels F, et al. 1991. Predominance of a single genotype of *Mycobacterium tuberculosis* in countries of east Asia. *J Clin Microbiol* 1995;33:3234-8
- Ward, William W. dan Swiatek, Gavin. 2009. Protein purification. *Current Analytical Chemistry*, Vol. 5, No. 2.
- Ward, W. W. dan Cormier, M. J. 1979. An energy transfer protein in coelenterate bioluminescence: characterization of the *Renilla* green-fluorescent protein. *J. Biol. Chem.*, 254, 781-88.
- Wards BJ, de Lisle GW, Collins DM. 2000. An esat6 knockout mutant of *Mycobacterium bovis* produced by homologous recombination will contribute to the development of a live tuberculosis vaccine. *Tuber Lung Dis.* 2000; 80(4-5):185-9.
- Waugh, David S. 2005. Reprint of : Making The Most of Affinity Tags. *TRENDS in Biotechnology* Vol.23 No.6 June 2005.
- Weiss, R. A. 2002. Virulence and pathogenesis. *Trends Microbiol.*, 10. 314-317
- WHO. 2013. *Global Tuberculosis Report 2013*.
- Wilkinson RJ, Haslov K, Rappuoli R, Giovannoni F, Narayanan PR, Desai CR, et al. 1997. Evaluation of The Recombinant 38-kiloDalton Antigen of *Mycobacterium tuberculosis* as a Potential Immunodiagnostic Reagent. *J Clin Microbiol*; 35:553-7.
- Welin, A., Winberg, M. E., Abdalla, H., Särndahl, E., Rasmusson, B., Stendahl, O., Lerm, M. 2008. Incorporation of *Mycobacterium tuberculosis* lipooligosaccharide into macrophage membrane rafts is a prerequisite for the phago-somal maturation block. *Infect Immun.* 2008 Jul; 76(7):2882-7.
- Werner, M.H., Clore, G.M., Gronenborn, A.M., Kondoh, A., Fisher, R.J. 1994. Refolding proteins by gel filtration chromatography. *FEBS Letter* 345, pp. 125-130.
- Wetlauffer, D. B., P. A. Branca, and G.-X. Chen. 1987. The oxidative folding of proteins by disulfide plus thiol does not correlate with redox potential. *Protein Eng.* 2: 141-146.

Wolfe LM, Mahaffey SB, Kruh NA, Dobos KM. 2010. Proteomic definition of the cell wall of *Mycobacterium tuberculosis*. *J Proteome Res.* 2010 Nov 5; 9(11):5816-26.

Williams, D.C., Van Frank, R.M., Muth, W.L., Burnett, J.P. 1982. Cytoplasmic inclusion bodies in *Escherichia coli* producing biosynthetic human insulin proteins. *Science* 215, pp. 687–689.

Young DB, Garbe TR. 1991. Lipoprotein antigens of *Mycobacterium tuberculosis*. *Res Microbiol.* 1991 Jan; 142(1):55-65.

Zuber B, Chami M, Houssin C, Dubochet J, Griffiths G, Daffé M. 2008. Direct visualization of the outer membrane of mycobacteria and corynebacteria in their native state. *J Bacteriol.* 2008 Aug; 190(16):5672-80.

